



# **Rocky Flats Environmental Technology Site**

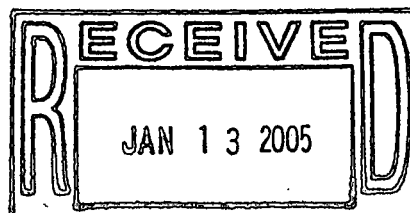
## **TYPE 1 RECONNAISSANCE LEVEL CHARACTERIZATION REPORT (RLCR)**

### **SEWAGE TREATMENT PLANT CHLORINE CONTACT BASINS CLOSURE PROJECT (995-CCC-1 and 995-CCC-2)**

**REVISION 0**

**December 20, 2004**

**CLASSIFICATION REVIEW NOT REQUIRED PER  
EXEMPTION NUMBER CEX-005-02**



**ADMIN RECORD**

**BZ-A-000788**

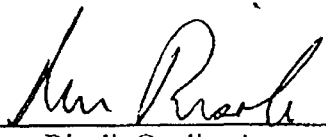
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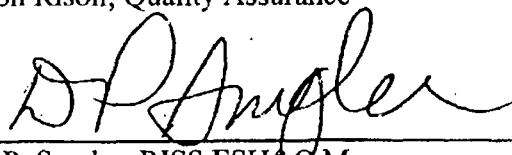
**December 20, 2004**

Reviewed by:

  
Don Risoli, Quality Assurance

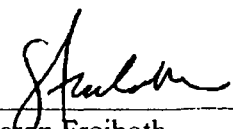
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- A Facility Location Map
- B Historical Site Assessment Report
- C Radiological Data Summaries and Survey Maps
- D Chemical Data Summaries and Sample Maps
- E Data Quality Assessment (DQA) Detail

## ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
CERCLA	Comprehensive Emergency Response, Compensation and Liability Act
DCGL <sub>EMC</sub>	Derived Concentration Guideline Level – elevated measurement comparison
DCGL <sub>W</sub>	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity
VOCs	Volatile organic compounds

## EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) was performed to enable facility "Typing" per the DPP (10/8/98), and compliant disposition and waste management of the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2. Because these facilities were anticipated Type 1 facilities, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) requirements. All facility surfaces were characterized in this RLC, including the interior and exterior surfaces (i.e., floor and walls only – no ceiling or roof exists). Environmental media beneath and surrounding the facilities were not within the scope of this RLCR and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA. The water depletion issue will be addressed in the Adaptive Management Plan and the RI/FS.

The RLC encompassed both radiological and chemical characterization to enable compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report.

Results indicate that no radiological contamination exists in excess of the PDSP unrestricted release limits of DOE Order 5400.5. All beryllium sample results were less than  $0.1 \mu\text{g}/100\text{cm}^2$ . The buildings were inspected visually for asbestos containing building material. Based on this visual inspection, no building materials suspected of containing asbestos were identified, therefore, sampling was not performed as part of this RLCR. All demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), and Environmental Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal*, as applicable.

Based upon the data presented in this RLCR, the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 are considered Type 1 facilities. To ensure the facilities remain free of contamination and RLC data remain valid, Level 2 Isolation Controls have been established and the facilities posted accordingly.

## 1 INTRODUCTION

A Reconnaissance Level Characterization (RLC) was performed to enable compliant disposition and waste management of the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2. Because these facilities were anticipated Type 1 facilities, a PDS characterization was performed. All facility surfaces were characterized in this RLC, including the interior and exterior surfaces of the facility (i.e., floor and walls only – no ceiling or roof exists). Environmental media beneath and surrounding the facilities were not within the scope of this RLCR and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA. The water depletion issue will be addressed in the Adaptive Management Plan and the RI/FS.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed, among these are the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2. The location of these facilities is shown in Attachment A, *Facility Location Map*. These facilities no longer support the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs. The remaining Sewage Treatment Plant buildings not included in this RLCR have already been characterized, or will be characterized in the future, and documented in stand-alone RLCRs and submitted to the DOE and CDPHE for review and concurrence.

Before these facilities can be removed or demolished, a Reconnaissance Level Characterization (RLC) must be conducted; this document presents the RLC results. The RLC was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The RLC built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report.

### 1.1 Purpose

The purpose of this report is to communicate and document the results of the RLC effort. An RLC is performed before Type 1 building demolition to define the pre-demolition radiological and chemical conditions of a facility. Pre-demolition conditions are compared with the unrestricted release limits for radiological and non-radiological contaminants. RLC results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

### 1.2 Scope

This report presents the pre-demolition radiological and chemical conditions of the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2. Environmental media beneath and surrounding the facilities was not within the scope of this RLCR and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

### 1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this RLC were the same DQOs identified in the Pre-Demolition survey Plan for D&D Facilities (MAN-127-PDSP.) Refer to section 2.0 of MAN-127-PDSP for these DQOs.

## 2 HISTORICAL SITE ASSESSMENT

A facility-specific Historical Site Assessment (HSA) was conducted to understand the facility histories and related hazards. The assessment consisted of facility walk-downs, interviews, and document review, including review of the Historical Release Report (refer to the D&D Characterization Protocol, MAN-077-DDCP). These assessments were used to identify data gaps and needs, and to develop radiological and chemical characterization plans. The facility-specific HSAs are documented in the *Historical Site Assessment Report (HSAR) for the Area 5 - Group 17 facilities*, Dated April, 2003, Revision 1. Refer to Attachment B, *Historical Site Assessment Report*, for a copy of the facility-specific HSAR. In summary, the HSAR identified minimal potential for radiological and chemical hazards in Sewage Treat Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2.

## 3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

The Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 were characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern. Based upon a review of historical and process knowledge, building walk-downs, and MARSSIM guidance, a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to the RISS Characterization Project files).

Radiological survey unit packages 995CC1 and 995CC2 were developed all surfaces of Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2. The survey packages were developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA), removable surface activity (RSA), and scan measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*.

Seventeen (17) TSA measurements (15 random and 2 QC) and fifteen (15) RSA measurements (15 random) were performed; and a minimum of 20% of the facility surfaces were scanned on all surfaces of each facility. The RLC data confirmed that these facilities do not contain radiological contamination above the surface contamination guidelines provided in the PDSP. Radiological survey data, statistical analysis results, and survey locations are presented in Attachment C, *Radiological Data Summary and Survey Maps*. The radiological survey unit packages are maintained in the RISS Characterization Project files. Level 2 Isolation Control postings are displayed on the facilities to ensure no radioactive materials are inadvertently introduced.

#### 4 CHEMICAL CHARACTERIZATION AND HAZARDS

The Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 were characterized for chemical hazards per the PDSP. Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on, or in the facilities. Based upon a review of historical and process knowledge, visual inspections, and PDSP DQOs, additional sampling needs were determined. A Chemical Characterization Plan (refer to RISS Characterization Project files) was developed during the planning phase that describes sampling requirements, the justification for the sample locations and estimated sample numbers. Contaminants of concern included asbestos, beryllium, RCRA/CERCLA constituents, lead and PCBs. Refer to Attachment D, *Chemical Data Summaries and Sample Maps*, for details on sample results and sample locations

##### 4.1 Asbestos

A survey of building materials suspected of containing asbestos was conducted in Sewage Treatment Plant-Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 in accordance with the RLCP. A CDPHE-certified asbestos inspector conducted the inspection in accordance with the *Asbestos Characterization Protocol, PRO-563-ACPR, Revision 1*. No building materials suspected of containing asbestos were identified for sampling, therefore, asbestos sampling was not performed as part of this RLC.

##### 4.2 Beryllium (Be)

Based on the HSAR and personnel interviews, the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 were anticipated Type 1 facilities. There was not, however, adequate historical and process knowledge to conclude that beryllium was not used or stored in these facilities. Therefore, biased beryllium sampling was performed in accordance with the PDSP and the *Beryllium Characterization Procedure, PRO-536-BCPR, Revision 0, September 9, 1999*. Biased sample locations corresponded with the most probable areas of dust accumulation (including beryllium dust), assuming airborne deposition.

All beryllium smear sample results were less than  $0.1 \mu\text{g}/100\text{cm}^2$  and meet the unrestricted release limits. Beryllium laboratory sample data and location maps are contained in Attachment D, *Chemical Data Summaries and Sample Maps*.



#### **4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]**

Based on a review of the HSAR and facility walk-downs, the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 are part of the RFETS sanitary waste treatment system that was used to receive treated waste water. The basins were used to disinfect treated water prior to discharge. Disinfection was accomplished by chlorinating the water with chlorine gas, and there is no reason to suspect that this process would have led to RCRA/CERCLA contamination. On this basis, no RCRA/CERCLA sampling was performed as part of this RLC.

Sampling for lead in paint in the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 was not performed based on the fact that the only lead concern would be in the paint and there are no painted surfaces on or in these facilities. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal*, states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal.

#### **4.4 Polychlorinated Biphenyls (PCBs)**

Based on the HSAR, interviews and a facility walk-down of the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2, PCB-containing equipment was never present in these basins and the system was never susceptible to receiving PCBs. On this basis, PCB sampling was not performed as part of the RLC.

### **5 PHYSICAL HAZARDS**

Physical hazards associated with the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 consist of those common to standard industrial environments and include hazards associated with energized systems, utilities, and trips and falls. However, care should be taken during demolition activities as Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 are located near PAC 000-500 "Sanitary Sewer System - Active". The facilities have been relatively well maintained and are in good physical condition, therefore, do not present hazards associated with building deterioration. Walkways with handrails are erected around the tops of the basins to prevent personnel from falling into the basins. Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

## 6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2, and consequent waste management decisions, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments C and D) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original DQOs of the project.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- ◆ the *number* of samples and surveys;
- ◆ the *types* of samples and surveys;
- ◆ the sampling/survey process as implemented "in the field"; and,
- ◆ the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment E.

## 7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The demolition and disposal of the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 will generate sanitary waste only. Estimated waste volumes are presented below. There is no radioactive or hazardous waste.

Waste Volume Estimates and Material Types							
Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
995-CCC-1	100	0	25	0	0	0	NONE
995-CCC-2	600	0	100	0	0	0	NONE

## 8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 are classified as RFCA Type 1 facilities pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999) and are acceptable for demolition. The Type 1 classification is based on a review of historical and process knowledge, and newly acquired RLC data.

The RLC of the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 was performed in accordance with the DDCP and PDSP requirements. All PDSP DQOs were met, and all data satisfied the PDSP DQA criteria. The Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 do not contain radiological or hazardous waste. All demolition debris will be managed as sanitary waste.

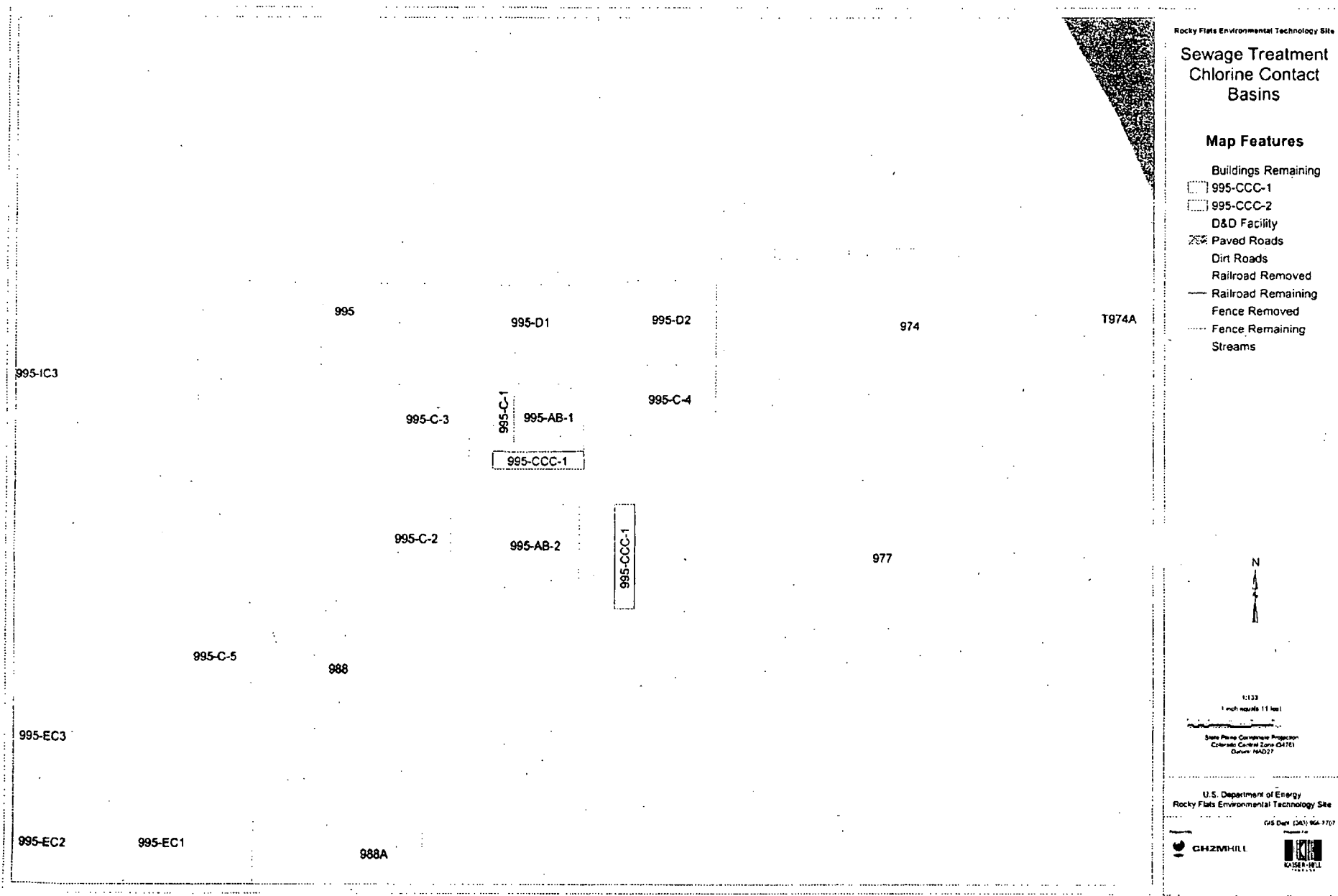
Environmental media beneath and surrounding the facilities will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA. The water depletion issue will be addressed in the Adaptive Management Plan and the RI/FS. To ensure the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 remain free of contamination and RLC data remain valid, Level 2 Isolation Controls have been established with the required postings to prevent the inadvertent introduction of contaminants.

## 9 REFERENCES

- DOE/RFEO, CDPHE, EPA, 1996. *Rocky Flats Cleanup Agreement (RFCA)*, July 19, 1996.
- DOE Order 5400.5, "Radiation Protection of the Public and the Environment."
- EPA, 1994. "The Data Quality Objective Process," EPA QA/G-4.
- K-H, 1999. *Decommissioning Program Plan*, June 21, 1999.
- MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.
- MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.
- MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 3, July 15, 2002.
- MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.
- MARSSIM - *Multi-Agency Radiation Survey and Site Investigation Manual*, December 1997 (NUREG-1575, EPA 402-R-97-016).
- PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure*, Rev. 1, May 22, 2001.
- PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 1, May 22, 2001.
- PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.
- PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.
- PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.
- PRO-563-ACPR, *Asbestos Characterization Procedure*, Revision 0, August 24, 1999.
- PRO-536-BCPR, *Beryllium Characterization Procedure*, Revision 0, August 24, 1999.
- RFETS, *Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition*.
- RFETS, *Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal*.
- RFCA Standard Operation Protocol for Recycling Concrete*, September 28, 1999.
- Historical Site Assessment Report (HSAR) for the Area 5 - Group 17 facilities*, Dated April, 2003, Revision 1.

# ATTACHMENT A

## Facility Location Map



## ATTACHMENT B

# Historical Site Assessment Report

**D&D RISS Facility Characterization  
Historical Site Assessment Report  
April, 2003 Rev. 1**

**Facility ID: (AREA 5 - GROUP 17)**

Anticipated Facility Type (1, 2, or 3): Buildings 988A, 995-CCC-1, 995-CCC-2, 995-C-5, 995-EC1, 995-EC2, 995-EC3, 995-IC1, 995-IC2, and 995-IC3 are anticipated Type 1 facilities.

Buildings 974, 977, 995-AB-1, 995-AB-2, 995-C-1, 995-C-2, 995-C-3, 995-C-4, 995-D1, and 995-D2 are anticipated Type 2 facilities.

This facility-specific Historical Site Assessment (HSA) has been performed in accordance with:  
*D&D Characterization Protocol*, RFETS MAN-077-DDCP, latest version, and  
*Facility Disposition Program Manual*, RFETS MAN-076-FDPM, latest version

**Physical Description**

**Building 974**

Building 974 is a 2,280 square-foot non-insulated metal building, used to house 4 sludge drying beds. The drying beds were originally only covered by a roof, but were enclosed in the late 1980s. The original drying beds were constructed of sand. In the late 1980s, concrete drying beds were constructed over the original sand drying beds.

Building 974 has the following utilities: electric.

**Building 977**

Building 977 is a 2,880 square-foot non-insulated metal building, used to house 4 sludge drying beds. The drying beds were originally only covered by a roof, but were enclosed in the late 1980s or early 1990s. The original drying beds were constructed of sand. In the late 1980s, concrete drying beds were constructed over the original sand drying beds. Building 977 has the following utilities: electric.

**Building 988A**

Building 988A is the 432 square-foot building constructed in 1996. This building is constructed of insulated metal sections mounted to a steel frame and a concrete floor.

Building 988A has the following utilities: electric.

**Aeration Basins 995-AB-1 and 995-AB-2**

The aeration basins are each approximately 625 square-feet and constructed of concrete. The north aeration basin (995-AB-1) was constructed in 1953 and the south aeration basin (995-AB-2) was constructed in the mid 1970s. These basins are open topped basins and are equipped with air diffusers to assist in the aeration process. The compressors used to aerate the basins are located in Building 988.

The Aeration Basins have the following utilities: electric.



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**Chlorine Contact Basins 995-CCC-1 and 995-CCC-2**

Chlorine Contact Basins 995-CCC-1 is approximately 65 square-feet. Chlorine Contact Basins 995-CCC-2 is approximately 200 square-feet. Both basins were built in 1953 and are constructed of concrete.

The Chlorine Contact Basins have the following utilities: electric.

**Clarifier Basins 995-C-1, 995-C-2, 995-C-3, 995-C-4 and 995-C-5**

Clarifier Basins 995-C-1 is approximately 200 square feet, 995-C-2 is approximately 300 square-feet, 995-C-3 is approximately 600 square-feet, 995-C-4 is approximately 650 square feet, and 995-C-5 is approximately 600 square-feet. Clarifier 995-C-1, 995-C-3, and 995-C-4, are concrete basins constructed as in 1953. Clarifier 995-C-2 and 995-C-5 are concrete basins constructed in the 1970s.

The Clarifier Basins have the following utilities: electric.

**Digesters 995-D1 and 995-D2**

The Digesters Basins 995-D1 and 995-D2 are approximately 500 square-foot concrete basins constructed in 1953.

The Digester Basins have the following utilities: electric.

**Effluent Cells 995-EC1, 995-EC2 and 995-EC3,**

The wastewater treatment plant has three 1,836 square-foot effluent cells that were constructed in 1996. These effluent treatment cells are concrete basins used to temporarily store wastewater prior to discharge to the B-Series Ponds. The effluent cells are located south east of Building 995.

The Effluent Cells have the following utilities: electric.

**Influent Cells 995-IC1, 995-IC2 and 995-IC3.**

The wastewater treatment plant has three 1,271 square-foot influent cells and that were constructed in 1996. These influent storage cells are concrete basins used to temporarily store wastewater entering the wastewater treatment facility and are located west of Building 995.

The Influent Cells have the following utilities: electric.

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**Historical Operations**

**Building 974**

The west side of Building 974 houses drying beds 1, 2, 3, and 4. The east side of Building 974 is used for general storage and houses some old out-of-service sludge drying equipment. Building 974 originally had sand drying beds and was an open-sided structure. In the late 1980s walls were added to the structure and the current concrete drying beds were constructed over the existing sand beds. These upgrades were performed to prevent wind-blown dispersion of the sludge and help prevent the occasional overflow from the sludge drying beds. PAC 900-141 "Sludge Dispersal" details some of the earlier events related to the sludge drying beds. PAC 900-141 had its NFA approved in 1997. Historically the sanitary sludge was designated as low-level waste. In the summer of 2002 the low-level waste designation was removed.

**Building 977**

Building 977 houses drying beds 5, 6 and 7. Building 977 originally had sand drying beds and was an open-sided structure. In the late 1980s walls were added to the structure and the current concrete drying beds were constructed over the existing sand beds. These upgrades were performed to prevent wind-blown dispersion of the sludge and help prevent the occasional overflow from the sludge drying beds. PAC 900-141 "Sludge Dispersal" details some of the earlier events related to the sludge drying beds. PAC 900-141 had its NFA approved in 1997. Historically the sanitary sludge was designated as low-level waste. In the summer of 2002 the low-level waste designation was removed.

**Building 988A**

Building 988A is the Ultraviolet Disinfecting Facility and delivers a lethal dose of ultraviolet light to any microorganisms remaining in the treated wastewater prior to being discharged to the B-Series Ponds.

**Aeration Basins 995-AB-1 and 995-AB-2**

The aeration basins are used to aerate the sewage to encourage bacterial growth. Sludge from the primary clarifier enters the aeration basin where it is mixed and aerated to promote biological decomposition of organic constituents in the wastewater.

**Chlorine contact chambers 995-CCC-1 and 995-CCC-2**

The chlorine contact basins are used to chlorinate the wastewater during the wastewater treatment process.

**Clarifier Basins 995-C-1, 995-C-2, 995-C-3 and 995-C-4**

Clarifier Basin 995-C-1 and 995-C-2 is the primary clarifiers and are used to settle out solids after the wastewater is passed through the grit remover and the bar screen. The secondary clarifiers, 995-C-3 and 995-C-4, receive wastewater after it has been aerated to help settle out solid material. Flocculent (primarily lime and a cationic polymer) are added in the tertiary clarifier (995-C-5) to settle out finer solids. The sludge collected from the bottom of the primary, secondary and tertiary clarifiers are returned to the digester basins for further processing.

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**Digesters 995-D1 and 995-D2,**

Sludge from the clarifier basins is sent to the digesters where the activated sludge breaks down the organic constituents. The digester basins have heat exchanges connected to heaters located in Building 995. The digester must be kept at a constant temperature in maximize the microbial action in the digester.

**Effluent Cells 995-EC1, 955-EC2 and 995-EC3,**

The effluent tanks are used to store wastewater so they can be evaluated to determine whether they need to be treated or discharged. The effluent and influent cells are connected by piping so their use is interchangeable.

**Influent Cells 995-IC1, 995-IC2 and 995-IC3.**

The primary purpose of the influent cells is to equalize flow to the wastewater treatment facility and prevent any toxic constituents from reaching the activated sludge system. The effluent and influent cells are connected by piping so their use is interchangeable.

**Current Operational Status**

The facilities addressed in this HSA are all currently operational.

**Contaminants of Concern**

**Asbestos**

*Describe any potential, likely, or known sources of Asbestos:*

Building 995 has asbestos posting. None of the facilities addressed in this HSA have had a comprehensive building inspection.

**Beryllium (Be)**

*Describe any potential, likely, or known Be production or storage locations:*

None of the facilities addressed in this HSA are on the RFETS list of Historic and Present Beryllium Areas.

*Summarize any recent Be sampling results:*

There is not recent Be data for the facilities addressed in this HSA.

**Lead**

*Describe any potential, likely, or known sources of Lead (e.g., paint, shielding, etc.):*

Based on the age of some of the facilities addressed in this HSA, lead in paint should not be a concern. No processes containing lead were conducted in these facilities.

**D&D RISS Facility Characterization  
Historical Site Assessment Report  
April, 2003 Rev. 1**

**RCRA/CERCLA Constituents**

*Describe any potential, likely, or known sources of RCRA/CERCLA constituents (e.g., chemical storage, waste storage, and processes):*

The primary chemicals used in the wastewater treatment process were chlorine, lime and a polymer flocculent. The sanitary sewer system did not regularly receive RCRA/CERCLA Waste streams, but historically small volumes of acids, bases, solvents and photo developing chemical were discharged to the sanitary sewer system. See the IHSS, PAC, or UBC section for additional release information.

*Describe any potential, likely, or known spill locations (and sources, if any):*

A chromium Acid spill in 1989 killed the digestive microbes in the sanitary sewer system which caused inadequately treated waste to be discharged. This event was reported as part of the sanitary sewers system's NPDES permit.

*Describe methods in which spills were mitigated, if any:*

None.

**PCBs**

*Describe any potential, likely, or known sources of PCBs (e.g., light ballasts, paints, equipment, etc.):*

No PCB containing process where housed in any of the facilities addressed in this HSA. No process equipment containing PCBs were located in any of these facilities. Given the age of some of these facilities PCBs in paint may be a concern.

*Describe any potential, likely, or known spill locations (and sources, if any):*

No PCB spills occurred in any of the Facilities addressed in this HSA.

*Describe methods in which spills were mitigated, if any:*

No PCB spills occurred in any of the Facilities addressed in this HSA.

**D&D RISS Facility Characterization  
Historical Site Assessment Report  
April, 2003 Rev. 1**

**Radiological Contaminants**

*Describe any potential, likely, or known radiological production or storage locations:*

In the early days of RFETS operations low levels of radioactive material in waste was discharged to the sanitary sewer system. This practice was stopped in the 1970s. The 1969 plutonium fire also caused a discharge of radiological material to the sanitary sewer system. The elevated radiological material in the system was primarily caused by firewater used to control the fire entering the system through the floor drains in the effected areas. PAC 000-500, "Sanitary Sewer System" describes some of the releases to the sanitary sewer system. See the IHSS, PAC, or UBC section for additional release information.

*Describe any potential, likely, or known spill locations (e.g., known leaking sealed radioactive sources, leaking waste drums, potentially contaminated drains, etc.):*

PAC 000-500, "Sanitary Sewer System" describes some of the releases to the sanitary sewer system. See the IHSS, PAC, or UBC section for additional release information.

*Describe methods in which spills were mitigated, if any:*

None.

*Describe any potential, likely, or known isotopes of concern (e.g., weapons grade plutonium, uranium isotopes, pure beta emitters, mixed fission products, etc.):*

Isotopes of concern include uranium and plutonium.

*Describe any potential, likely, or known external facility contamination (e.g., stack release points, unfiltered ventilation, facility's physical location to known site releases, etc.):*

See section below for information on IHSSs PACs, and UBCs.

# D&D RISS Facility Characterization Historical Site Assessment Report April, 2003 Rev. 1

## Environmental Restoration Concerns

*Describe any ER concerns that could affect facility characterization (e.g., IHSSs, PACs, UBCs):*

Buildings 974, 977, 988A, and Basins 995-AB-1 995-AB-2, 995-CCC-1, 995-CCC-2, 955-C-1, 995-C-2, 995-C-3, 995-C-4, 995-D1, 995-D2, 995-EC1, 955-EC2, 995-EC3, 995-IC1, 995-IC2, and 995-IC3 are associated or effected by the following IHSSs, PACs, or UBCs. See individual IHSS, PAC, or UBC report for additional information.

- 1) PAC 000-500, "Sanitary Sewer System" Active

Building 974 and 977 are located on the following IHSSs, PACs, and UBCs. See individual IHSS, PAC, or UBC report for additional information.

- 1) PAC 900-141 "Sludge Disposal", NFA approved 1997.

Building 977 are located near the following IHSSs, PACs, and UBCs. See individual IHSS, PAC, or UBC report for additional information.

- 1) PAC 000-190 "Caustic Leak " Active.

## Additional Information

*Describe any additional information that may be useful during facility characterization (e.g., contaminant migration routes, waste handling operations, physical hazards, Historical Release Reports, WSRIC data, etc.):*

None

## References

*Provide all sources of information utilized to gather data for facility history (e.g., documents, files, interviews):*

Sources reviewed to complete this HSA were the RFETS Facility List, the Historical Release Report, Site Master List of RCRA Units, and the Site IHSS, PAC, and UBC databases. The WSRIC for those buildings with a WSRIC. In addition, a facility walkdown and interviews were performed.

## Waste Volume Estimates and Material Types

Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
Building 974	1,200	0	300	500	0	TBD	N/A
Building 977	1,500	0	400	600	0	TBD	N/A
Building 988A	400	0	200	200	0	TBD	N/A
995-AB-1	600	0	100	0	0	TBD	N/A
995-AB-2	600	0	100	0	0	TBD	N/A
995-CCC-1	100	0	25	0	0	TBD	N/A
995-CCC-2	600	0	100	0	0	TBD	N/A
955-C-1	300	0	50	0	0	TBD	N/A
955-C-2	500	0	100	0	0	TBD	N/A
955-C-3	800	0	200	0	0	TBD	N/A
955-C-4	800	0	200	0	0	TBD	N/A

**D&D RISS Facility Characterization  
Historical Site Assessment Report  
April, 2003 Rev. 1**

995-D1	1,000	0	200	0	0	TBD	N/A
995-D2	1,000	0	200	0	0	TBD	N/A
995-EC-1	3,200	0	300	0	0	TBD	N/A
995-EC-2	3,200	0	300	0	0	TBD	N/A
995-EC-3	3,200	0	300	0	0	TBD	N/A
995-IC1	2,400	0	200	0	0	TBD	N/A
995-IC2	2,400	0	200	0	0	TBD	N/A
995-IC3	2,400	0	200	0	0	TBD	N/A

**Further Actions**

*Recommend any further actions, if any (e.g., characterization, decontamination, special handling, etc.):*

Begin the RLC/PDS process.

**Note:**

This HSA was performed prior to SME walkdowns, and chemical and radiological characterization package preparations. SMEs should evaluate and/or verify all information during the RLC/PDS process. SMEs may need to review additional documentation and perform additional interviews. Information contained in this HSA only represents a "snapshot" in time. Subsequent data may be obtained during SME walkdowns and chemical and radiological characterization package preparations, which may conflict with this report. However, this report will not be amended, and the newer data will take precedence over the data in this report. Newer Data will appear in the RLCR/PDSR.

Prepared By: Duane Parsons / / April 2003  
Name Signature Date

## ATTACHMENT C

### Radiological Data Summaries and Survey Maps



Survey Area: 5

Survey Unit: 995CC1

Building: 995-CCC-1

Description: B995-CCC-1 Chlorine Contact Basin (All Surfaces)

## Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

### Total Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr QC Required: 2

Nbr Random Measurements Performed: 15

Nbr Biased Measurements Performed: 0

Nbr QC Performed: 2

#### Alpha

Maximum: 57.7 dpm/100cm<sup>2</sup>  
Minimum: -6.3 dpm/100cm<sup>2</sup>  
Mean: 42.4 dpm/100cm<sup>2</sup>  
Standard Deviation: 16.7  
QC Maximum: 45.8 dpm/100cm<sup>2</sup>  
QC Minimum: 39.6 dpm/100cm<sup>2</sup>  
QC Mean: 42.7 dpm/100cm<sup>2</sup>  
Transuranic DCGLw: 100.0 dpm/100cm<sup>2</sup>  
Transuranic DCGL<sub>EMC</sub>: 300.0 dpm/100cm<sup>2</sup>

### Removable Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 15

Nbr Biased Measurements Performed: 0

#### Alpha

Maximum: 2.7 dpm/100cm<sup>2</sup>  
Minimum: -0.3 dpm/100cm<sup>2</sup>  
Mean: 1.1 dpm/100cm<sup>2</sup>  
Standard Deviation: 0.9  
Transuranic DCGLw: 20.0 dpm/100cm<sup>2</sup>

### Media Sample Results

Nbr Random Required: 0

Nbr Biased Required: 0

Nbr Random Collected: 0

Nbr Biased Collected: 0

*Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.*

Survey Area: 5	Survey Unit: 995CCC1	Building: 995CCC1
Description: B095CCC1 Chlorine Contact Basin (All Surfaces)		

### Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm <sup>2</sup> )		Survey Type
							Alpha	Beta	Alpha	Beta	
1	700831	12/14/04	Electra	3251	DP-6	01/07/05	0.219	NA	48.0	NA	T/S
2	711447	12/14/04	Electra	1379	DP-6	05/09/05	0.226	NA	48.0	NA	T/Q/S
3	700831	12/14/04	SAC-4	924	NA	02/04/05	0.330	NA	10.0	NA	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: 5

Survey Unit: 995CC1

Building: 995 CCC-1

Description: B995-CCC-1 Chlorine Contact Basin (All Surfaces)

## Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )	
995CC1PRP-N001	3	-0.3	N/A	
995CC1PRP-N002	3	1.2	N/A	
995CC1PRP-N003	3	1.2	N/A	
995CC1PRP-N004	3	1.2	N/A	
995CC1PRP-N005	3	2.7	N/A	
995CC1PRP-N006	3	1.2	N/A	
995CC1PRP-N007	3	1.2	N/A	
995CC1PRP-N008	3	-0.3	N/A	
995CC1PRP-N009	3	-0.3	N/A	
995CC1PRP-N010	3	1.2	N/A	
995CC1PRP-N011	3	1.2	N/A	
995CC1PRP-N012	3	1.2	N/A	
995CC1PRP-N013	3	2.7	N/A	
995CC1PRP-N014	3	1.2	N/A	
995CC1PRP-N015	3	1.2	N/A	

Comments:

Survey Area: 5

Survey Unit: 995CC1

Building: 995-CCC-1

Description: B995-CCC-1 Chlorine Contact Basin (All Surfaces)

## Random/QC Total Surface Activity Data Sheet

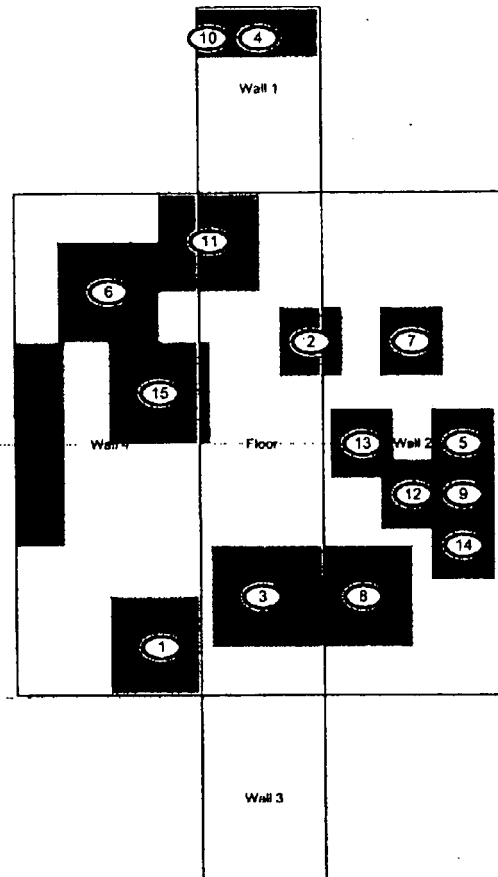
Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )	
995CC1PRP-N001	1	23.0	N/A	
995CC1PRP-N002	1	34.8	N/A	
995CC1PRP-N003	1	-6.3	N/A	
995CC1PRP-N004	2	53.7	N/A	
995CC1PRP-N005	2	48.0	N/A	
995CC1PRP-N006	1	57.7	N/A	
995CC1QRP-N006	2	45.8	N/A	
995CC1PRP-N007	1	50.4	N/A	
995CC1PRP-N008	1	56.3	N/A	
995CC1PRP-N009	2	49.3	N/A	
995CC1PRP-N010	2	36.0	N/A	
995CC1PRP-N011	1	34.8	N/A	
995CC1PRP-N012	1	51.7	N/A	
995CC1PRP-N013	1	51.7	N/A	
995CC1PRP-N014	1	53.1	N/A	
995CC1QRP-N014	2	39.6	N/A	
995CC1PRP-N015	1	41.2	N/A	

Comments:

# TYPE1 RLCR FOR CHLORINE CONTACT BASINS (CCC-1 & CCC-2)

Survey Area: 5      Survey Unit: 995CC1      Classification: 3  
 Building: 995-CCC-1  
 Survey Unit Description: B995-CCC-1 Chlorine Contact Basin (All Surfaces)  
 Total Area: 114 sq. m.      Total Floor Area: 24 sq. m.

PAGE 1 OF 1



<b>SURVEY MAP LEGEND</b> (N) Smear & TSA Location (D) Smear, TSA & Sample Location (B) Open/Inaccessible Area (A) Area in Another Survey Unit	Neither the United States Government nor Kaiser Hill Co., nor DynCorp I&ET, nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. <b>Scan Survey Information</b> Survey Instrument ID #(s) & RCT ID #(s): 1, 2	<div style="text-align: center;">   <b>N</b> </div> <div style="text-align: center;">           0 FEET 15          0 METERS 5          1 inch = 12 feet 1 grid sq. = 1 sq. m.       </div>	<div style="text-align: center;"> <b>U.S. Department of Energy</b>  <b>Rocky Flats Environmental Technology Site</b>          Prepared by: GIS Dept. 303-966-7707    <b>CH2MHILL</b>          Communications Group    <b>Kaiser Hill</b>          MAP ID: 03-02261995-CCC-1_SC      Dec.16, 2004       </div>
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Survey Area: 5

Survey Unit: 995CC2

Building: 995-CCC-2

Description: B995-CCC-2 Chlorine Contact Basin (All Surfaces)

## Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

### Total Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr QC Required: 2

Nbr Random Measurements Performed: 15

Nbr Biased Measurements Performed: 0

Nbr QC Performed: 2

#### Alpha

Maximum: 52.1 dpm/100cm<sup>2</sup>  
Minimum: 1.9 dpm/100cm<sup>2</sup>  
Mean: 25.1 dpm/100cm<sup>2</sup>  
Standard Deviation: 16.8  
QC Maximum: 52.4 dpm/100cm<sup>2</sup>  
QC Minimum: 39.1 dpm/100cm<sup>2</sup>  
QC Mean: 45.8 dpm/100cm<sup>2</sup>  
Transuranic DCGLw: 100.0 dpm/100cm<sup>2</sup>  
Transuranic DCGL<sub>EMC</sub>: 300.0 dpm/100cm<sup>2</sup>

### Removable Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 15

Nbr Biased Measurements Performed: 0

#### Alpha

Maximum: 2.7 dpm/100cm<sup>2</sup>  
Minimum: -0.3 dpm/100cm<sup>2</sup>  
Mean: 1.0 dpm/100cm<sup>2</sup>  
Standard Deviation: 1.0  
Transuranic DCGLw: 20.0 dpm/100cm<sup>2</sup>

### Media Sample Results

Nbr Random Required: 0

Nbr Biased Required: 0

Nbr Random Collected: 0

Nbr Biased Collected: 0

*Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.*

Survey Area: 5

Survey Unit: 995CCC2

Building: 995-CCC-2

Description: B995-CCC-2 Chlorine Contact Basin (All Surfaces)

## Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm <sup>2</sup> )		Survey Type
							Alpha	Beta	Alpha	Beta	
1	700831	12/14/04	Electra	3251	DP-6	01/07/05	0.219	NA	48.0	NA	T/S
2	711447	12/14/04	Electra	1379	DP-6	05/09/05	0.226	NA	48.0	NA	Q/S
3	700831	12/14/04	SAC-4	924	NA	02/04/05	0.330	NA	10.0	NA	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: 5

Survey Unit: 995CC2

Building: 995-CCC-2

Description: B995-CCC-2 Chlorine Contact Basin (All Surfaces)

## Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )	
995CC2PRP-N001	3	-0.3	N/A	
995CC2PRP-N002	3	1.2	N/A	
995CC2PRP-N003	3	-0.3	N/A	
995CC2PRP-N004	3	1.2	N/A	
995CC2PRP-N005	3	1.2	N/A	
995CC2PRP-N006	3	-0.3	N/A	
995CC2PRP-N007	3	-0.3	N/A	
995CC2PRP-N008	3	1.2	N/A	
995CC2PRP-N009	3	1.2	N/A	
995CC2PRP-N010	3	1.2	N/A	
995CC2PRP-N011	3	1.2	N/A	
995CC2PRP-N012	3	2.7	N/A	
995CC2PRP-N013	3	2.7	N/A	
995CC2PRP-N014	3	1.2	N/A	
995CC2PRP-N015	3	1.2	N/A	

Comments:



<b>Survey Area:</b> 5	<b>Survey Unit:</b> 995CC2	<b>Building:</b> 995CCC-2
<b>Description:</b> B995 CCC-2 Chlorine Contact Basin (All Surfaces)		

### Random/QC Total Surface Activity Data Sheet

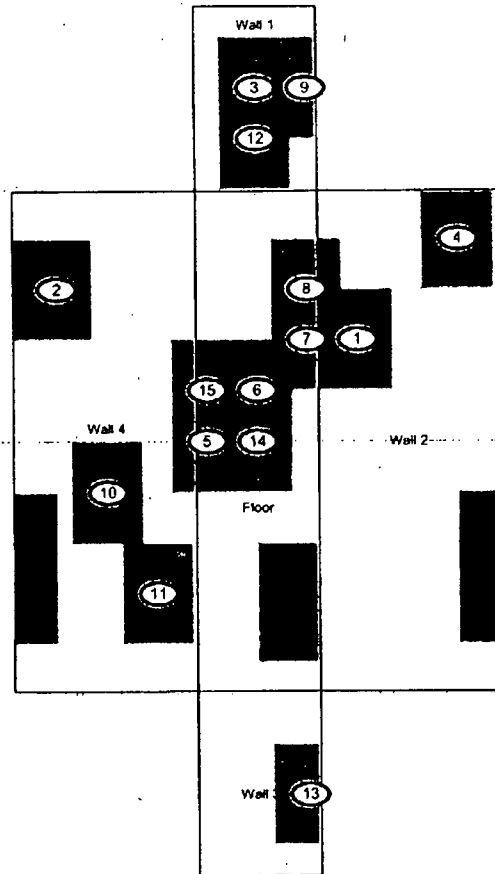
Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm <sup>2</sup> )	Net Beta (dpm/100cm <sup>2</sup> )	
995CC2PRP-N001	1	52.1	N/A	
995CC2QRP-N001	2	39.1	N/A	
995CC2PRP-N002	1	40.2	N/A	
995CC2PRP-N003	1	3.7	N/A	
995CC2PRP-N004	1	31.1	N/A	
995CC2PRP-N005	1	20.1	N/A	
995CC2PRP-N006	1	6.4	N/A	
995CC2PRP-N007	1	31.1	N/A	
995CC2PRP-N008	1	1.9	N/A	
995CC2PRP-N009	1	22.0	N/A	
995CC2PRP-N010	1	15.6	N/A	
995CC2PRP-N011	1	32.5	N/A	
995CC2PRP-N012	1	9.6	N/A	
995CC2PRP-N013	1	15.6	N/A	
995CC2PRP-N014	1	52.1	N/A	
995CC2QRP-N014	2	52.4	N/A	
995CC2PRP-N015	1	43.0	N/A	

Comments:

# TYPE1 RLCR FOR CHLORINE CONTACT BASINS (CCC-1 & CCC-2)

Survey Area: 5      Survey Unit: 995CC2      Classification: 3  
 Building: 995-CCC-2  
 Survey Unit Description: B995-CCC-2 Chlorine Contact Basin (All Surfaces)  
 Total Area: 114 sq. m.      Total Floor Area: 24 sq. m.

PAGE 1 OF 1



**SURVEY MAP LEGEND**  
 (1) Smear & TSA Location  
 (2) Smear, TSA & Sample Location  
 (3) Open/Inaccessible Area  
 (4) Area in Another Survey Unit

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**Scan Survey Information**  
 Survey Instrument ID #(s) & RCT ID #(s):  
 1, 2

**FEET**  
 0 15  
 0 5  
**METERS**

1 inch = 12 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy  
 Rocky Flats Environmental Technology Site  
 Prepared by: GIS Dept. 303-966-7707

**CH2MHILL**  
 Communications Group

**Kaiser Hill**

MAP ID: 03-0226/995-CCC-2\_SC      Dec. 16, 2004

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## ATTACHMENT D

### Chemical Data Summaries and Sample Maps

### Beryllium Data Summary

Sample Number	Map Point Location	Bldg	Sample Location	Result
RIN05D0162				
995-12142004-00-140	140	995-CCC-2	On Floor	<0.1 ug/100cm <sup>2</sup>
995-12142004-00-141	141	995-CCC-2	On Vertical Slat	<0.1 ug/100cm <sup>2</sup>
995-12142004-00-142	142	995-CCC-2	On Floor	<0.1 ug/100cm <sup>2</sup>
995-12142004-00-143	143	995-CCC-2	On Pipe	<0.1 ug/100cm <sup>2</sup>
995-12142004-00-144	144	995-CCC-2	On Wall	<0.1 ug/100cm <sup>2</sup>
995-12142004-00-145	145	995-CCC-1	On Floor	<0.1 ug/100cm <sup>2</sup>
995-12142004-00-146	146	995-CCC-1	On Wall	<0.1 ug/100cm <sup>2</sup>
995-12142004-00-147	147	995-CCC-1	On Vertical Slat	<0.1 ug/100cm <sup>2</sup>
995-12142004-00-148	148	995-CCC-1	On Wall	<0.1 ug/100cm <sup>2</sup>
995-12142004-00-149	149	995-CCC-1	On Vertical Slat	<0.1 ug/100cm <sup>2</sup>

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**SURVEY MAP LEGEND**

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CEC/CLA Sample Location
- PCB Sample Location

Open/Inaccessible Area

Area in Another Survey Unit

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accuracy, completeness, or usefulness of any information,  
apparatus, product, or process disclosed, or represents  
that its use would not infringe privately owned rights.

**N**

1 inch = 12 feet 1 grid sq. = 1 sq. m.

0 0  
METERS FEET  
5 15

U.S. Department of Energy  
Rocky Flats Environmental Technology Site

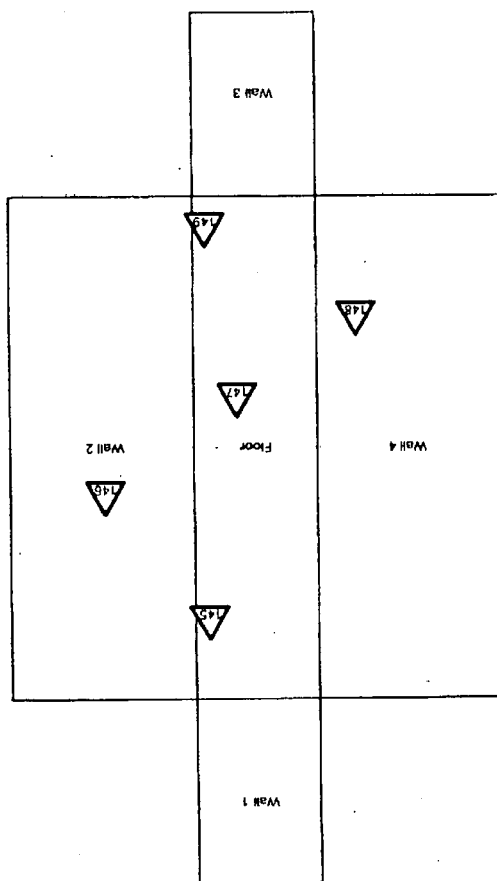
Prepared by: GIS Dept 303-966-7707

**CH2MHILL**  
Communications Group

Kaiser Hill

MAP ID: 03-02261995-CCC-1 BE

Dec. 16, 2004



**SURVEY MAP LEGEND**

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCA/CERCLA Sample Location
- PCH Sample Location

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Area in Another Survey Unit

Open/Inaccessible Area

1 inch = 12 feet 1 grid sq. = 1 sq. m.

0 0  
METERS FEET  
5 15

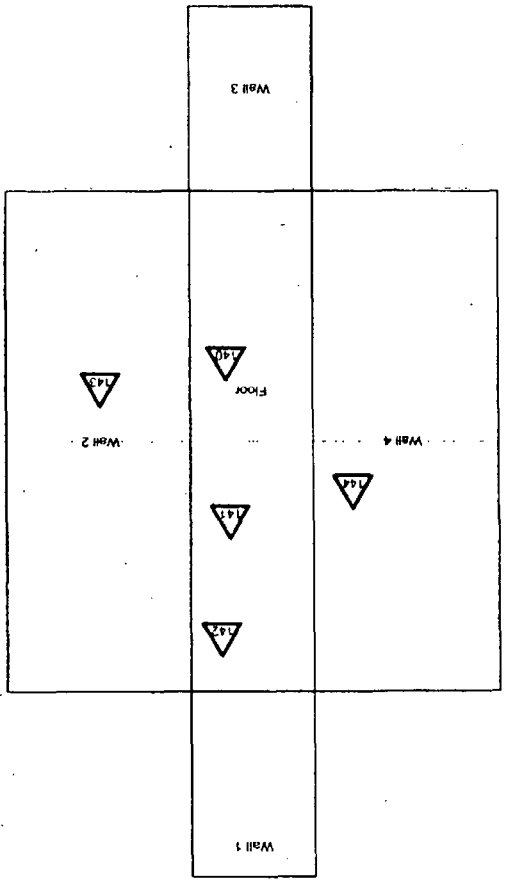
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COMMUNICATIONS GROUP

MAP ID: 03-0226995-CC-2-BE

Dec. 16, 2004

Prepared by: GIS Dept. 303-966-7707



**CHEMICAL SAMPLE MAP**  
Chlorine Contact Basin 995-CC-2  
Beryllium  
PAGE 1 OF 1

# ATTACHMENT E

## Data Quality Assessment (DQA) Detail

## DATA QUALITY ASSESSMENT (DQA)

### VERIFICATION & VALIDATION OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed; the radiological survey assessment is provided in Table E-1 and beryllium in E-2. A data completeness summary for all results is given in Table E-3.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project Files. This report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique (MARSSIM) Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Beta/gamma survey designs were not implemented for the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 based on the conservatism of the transuranic limits used as DCGLs in the unrestricted release decision process. Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. All survey results were evaluated against, and were less than the Transuranic DCGL<sub>w</sub> (100 dpm/100cm<sup>2</sup>) and the Uranium DCGL<sub>w</sub> (5,000 dpm/100cm<sup>2</sup>) unrestricted release limits.

Consistent with EPA's G-4 DQO process, the radiological survey design was optimized by checking actual measurement results (acquired during pre-demolition surveys) against model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

### SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification. All media surveyed and sampled yielded results less than their associated action levels and with acceptable uncertainties.



Based upon an independent review of the radiological data, it was determined that the original project DQOs satisfied MARSSIM guidance. All facility contamination levels were below applicable unrestricted release levels. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable procedures, survey units were properly designed and bounded, and instrument performance and calibration were within acceptable limits thereby ensuring data accuracy. All results meet the PDS unrestricted release criteria.

Chain of Custody was intact; documentation was complete, hold times were acceptable (where applicable,) and packaging integrity/custody seals were maintained throughout the sampling/analysis process. Level 2 Isolation Controls have been posted to prevent the inadvertent introduction of contamination into the facilities. On this basis, the Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2 meet the unrestricted release criteria with the confidences stated herein.

**Table E-1 V&V of Radiological Surveys**  
**Sewage Treatment Plant Chlorine Contact Basins 995-CCC-1 and 995-CCC-2**

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
	Parameters	Measure	Frequency	COMMENTS
ACCURACY	initial calibrations	90%<x<110%	≥1	Multi-point calibration through the measurement range encountered in the field; programmatic records.
	daily source checks	80%<x<120%	≥1/day	Performed daily/within range.
	local area background: Field	typically < 10 dpm	≥1/day	All local area backgrounds were within expected ranges (i.e., no elevated anomalies.)
PRECISION	field duplicate measurements for TSA	≥5% of real survey points	≥10% of reals	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Units 995CC1 AND 995CC2 (all surfaces).	statistical and biased	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random and biased measurement locations controlled/mapped to ±1m.
	Controlling Documents (Characterization Pkg; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	units of measure	dpm/100cm <sup>2</sup>	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys usable results vs. unusable	>95% >95%	NA	See Table E-3 for details.
SENSITIVITY	Detection limits	TSA: ≤ 50 dpm/100cm <sup>2</sup> RA: ≤ 10 dpm/100cm <sup>2</sup>	all measures	MDAs ≤ 50% DCGL <sub>w</sub> per MARSSIM guidelines (RLC performed to PDS requirements).

**Table E-2 V&V of Beryllium Results**  
**Sewage Treatment Plant-Chlorine Contact Basins 995-CCC-1 and 995-CCC-2**

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		COMMENTS
BERYLLIUM	Prep: NMAM 7300 METHOD: OSHA ID-125G	LAB ---->	Johns Manville Corp. Littleton, Colorado	
		RIN ---->	RIN 05D0162	
QUALITY REQUIREMENTS		Measure	Frequency	No qualifications significant enough to change project decisions, i.e., classification of Type I facilities confirmed. All results were below associated action levels.
ACCURACY	Calibrations			
	Initial	linear calibration	≥1	
	Continuing	80%<%R<120%	≥1	
	LCS/MS	80%<%R<120%	≥1	
	Blanks - lab & field	<MDL	≥1	
	interference check std (ICP)	NA	NA	
PRECISION	LCSD	80%<%R<120% (RPD<20%)	≥1	
	field duplicate	all results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	measurement units	ug/100cm <sup>2</sup>	NA	
COMPLETENESS	Plan vs. Actual samples	>95%	NA	
	usable results vs. unusable	>95%		
SENSITIVITY	detection limits	MDL of 0.00084ug/100cm <sup>2</sup>	All measures	

**Table E-3 Data Completeness Summary**  
**Sewage Treatment Plant-Chlorine Contact Basins 995-CCC-1 and 995-CCC-2**

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC) <sup>A</sup>	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Beryllium	995-CCC-1	5 biased	5 biased	No beryllium contamination found at any location, all results are below associated action levels	OSHA ID-125G; RIN 05D0162  No results above action level (0.2ug/100cm <sup>2</sup> ) or investigative level (0.1 ug/100cm <sup>2</sup> ).
Beryllium	995-CCC-2	5 biased	5 biased	No beryllium contamination found at any location, all results are below associated action levels	OSHA ID-125G  RIN 05D0162  No results above action level (0.2ug/100cm <sup>2</sup> ) or investigative level (0.1 ug/100cm <sup>2</sup> ).
Radiological	Survey Area 5 Survey Unit: 995CC1 Chlorine Contact Basin (all surfaces)	15 $\alpha$ TSA (random) and 15 $\alpha$ Smears (random)  2 QC TSA  20% scan of all remaining surfaces	15 $\alpha$ TSA (random) and 15 $\alpha$ Smears (random)  2 QC TSA  20% scan of all remaining surfaces	No elevated contamination at any location; all values below PDS unrestricted release levels	Transuranic DCGLs used.
Radiological	Survey Area 5 Survey Unit: 995CC2 Chlorine Contact Basin (all surfaces)	15 $\alpha$ TSA (random) and 15 $\alpha$ Smears (random)  2 QC TSA  20% scan of all remaining surfaces	15 $\alpha$ TSA (random) and 15 $\alpha$ Smears (random)  2 QC TSA  20% scan of all remaining surfaces	No elevated contamination at any location; all values below PDS unrestricted release levels	Transuranic DCGLs used.